

<b>Semester: VII</b>				
<b>Programme:</b> Bachelor of Management Studies (BMS)				
<b>Course: Advanced Research Analytics for Managers</b>				
<b>Paper code: C4BMS2372</b>				<b>Credits: 5</b>
<b>Category: Major</b>				
<b>Type: Practical</b>				
<b>No of Modules: 4</b>				
<p><b>Course Overview:</b>  This course provides students with advanced knowledge and practical skills in data analysis, visualization, and statistical modelling for managerial decision-making. It introduces techniques for data preparation, cleaning, and transformation using business analytics tools, along with the development of interactive dashboards and business intelligence reports. The course also focuses on the application of statistical analysis using software for hypothesis testing, correlation, regression, and reliability analysis. In addition, students are introduced to multivariate analysis techniques such as factor analysis, discriminant analysis, and logistic regression to analyze complex business data. Overall, the course equips students with analytical and technical competencies required for data-driven decision-making in modern organizations.</p>				
<p><b>Course Outcome:</b></p> <ol style="list-style-type: none"> <li>1. Students will be able to prepare, clean, and transform structured and unstructured data from multiple sources using data preparation tools in business analytics software.</li> <li>2. Students will be able to create interactive dashboards and apply data visualization, data modelling, and basic analytical functions to support managerial decision-making.</li> <li>3. Students will be able to perform statistical analysis using software to test hypotheses, analyse relationships, and interpret research data using parametric and non-parametric techniques.</li> <li>4. Students will be able to apply multivariate analysis techniques such as factor analysis, discriminant analysis, and logistic regression to solve complex business research problems.</li> </ol>				
<b>Prerequisites:</b> Basic knowledge about any prior course				
<b>SYLLABUS</b>				
<b>Unit/ Module</b>	<b>Content</b>	<b>Number of Classes</b>	<b>CO Mapping</b>	<b>Cognitive Level</b>
<b>1</b>	<p><b>Advanced Data Analysis Foundations (Using Power BI)</b></p> <p>Types of Data: Structured vs Unstructured;  Data Retrieval and Preparation: Importing Data from Excel, CSV, SQL, web APIs, Google Sheets, and Cloud Services;  Data Cleaning and Transformation: Removing Duplicates, Handling Missing Values, Merging, and Appending Queries, Changing Data Types, Filtering &amp; Sorting using Power Query Editor, Data Profiling (Column Quality, Column Distribution, Column Profile).</p>	<b>10</b>	<b>CO1</b>	<b>K3</b>
<b>2</b>	<p><b>Data Visualization &amp; Business Intelligence Tools (Using Power BI)</b></p> <p>Data Visualization: Creating Tables, Bar/Column/Line Charts, Maps, KPIs, Slicers, Cards, and Filters, using Bookmarks, Dataflow, Creating and Analyzing Dashboards (E-Commerce Dashboards).</p> <p><b>Data Modeling and Analysis:</b> Understanding, Creating, and Editing Relationships between Tables, Use DAX (Data Analysis Expressions), Use Basic DAX (Data Analysis Expressions) like Aggregation Functions (Sum, Average, Count, Max, Min), Logical Functions (If, And, Or), String Functions (Left, Right, Concatenate), Date and Time Functions, Lookup Functions, Statistical Functions (Median, Rank, Standard Deviation).</p>	<b>15</b>	<b>CO2</b>	<b>K6</b>

	Exporting Data for Offline Sharing as PDF, CSV/Excel.			
<b>3</b>	<b>Statistical Analysis using Software (SPSS)</b> Importing survey responses; Data screening: outlier detection, heteroskedasticity, tests of normality Reliability test using Cronbach alpha  Parametric tests: T-test (one-sample, two-sample), ANOVA (one-way and two-way); Correlation and Regression Analysis: Non-parametric tests: chi-square test, Fisher's exact test, Mann-Whitney U test, Wilcoxon signed rank test, Kruskal Wallis test.	<b>15</b>	<b>C03</b>	<b>K4</b>
<b>4</b>	<b>Multivariate Analysis Techniques (SPSS)</b> Factor Analysis – Principal Component Analysis (PCA); Discriminant Analysis; Logistic Regression.	<b>20</b>	<b>C04</b>	<b>K4</b>

#### Text Books

1. Leech, N. L., Barrett, K. C., & Morgan, G. A. (2005). SPSS for intermediate statistics: Use and interpretation (2nd ed.). Lawrence Erlbaum Associates, Inc.
2. Deckler, G., & Powell, B. (2022). Microsoft Power BI cookbook: Convert raw data into business insights with updated techniques, use cases, and best practices. Packt Publishing.
3. Cronk, B. C. (2018). How to use SPSS: A step-by-step guide to analysis and interpretation (10th ed.). Routledge.
4. Wagner, W. E. (2015). Using IBM SPSS statistics for research methods and social science statistics (5th ed.). SAGE Publications, Inc.

#### Suggested readings

1. Leech, N. L., Barrett, K. C., & Morgan, G. A. (2005). SPSS for intermediate statistics: Use and interpretation (2nd ed.). Lawrence Erlbaum Associates, Inc.
2. Hyman, J. (2022). Microsoft Power BI for dummies. Wiley.
3. Clark, D. (2020). Beginning Microsoft Power BI: A practical guide to self-service data analytics. A press.

#### Web Resources

1. <https://learn.microsoft.com/en-us/power-bi/>
2. <https://www.datacamp.com/tutorial/tutorial-power-bi-for-beginners>

### Course outcomes (COs) and Cognitive Level Mapping

COs	CO Description	Cognitive levels
<b>CO1</b>	Students will be able to prepare, clean, and transform structured and unstructured data from multiple sources using data preparation tools in business analytics software.	K3
<b>CO2</b>	Students will be able to create interactive dashboards and apply data visualization, data modelling, and basic analytical functions to support managerial decision-making.	K6
<b>CO3</b>	Students will be able to perform statistical analysis using software to test hypotheses, analyse relationships, and interpret research data using parametric and non-parametric techniques.	K4
<b>CO4</b>	Students will be able to apply multivariate analysis techniques such as factor analysis, discriminant analysis, and logistic regression to solve complex business research problems.	KS4